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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/712,108	11/14/2003	Cheng-Tsung Yu	0941-0752P	8218
2292	7590	05/18/2007		
BIRCH STEWART KOLASCH & BIRCH			EXAMINER	
PO BOX 747			MOORE, KARLA A	
FALLS CHURCH, VA 22040-0747			ART UNIT	PAPER NUMBER
			1763	
			NOTIFICATION DATE	DELIVERY MODE
			05/18/2007	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

**Office Action Summary**

Application No.

10/712,108

Applicant(s)

YU ET AL.

Examiner

Karla Moore

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 February 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2,4-8,11,12,14-17,20,21 and 23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-8,11,12,14-17,20,21 and 23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 0207,0307.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. The term "substantially no" in claims 1 and 11 is a relative term which renders the claim indefinite.

The term "substantially no" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Further, typically, when the two words are used in combination, as in the aforementioned claims, the term would allow for the presence of a gap. However, Applicant argues that their invention distinguishes over the prior art in that it has "no" gap, whereas, the prior art has a gap. Applicant's claim language and arguments are inconsistent and unclear.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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5. Claims 1-2, 4-7, 11-12 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,411,624 to Hirano et al. in view of U.S. Patent No. 4,793,975 to Drage.

6. Hirano et al. disclose a pedestal supporting a substrate in a plasma chamber as claimed in Figure 1 substantially as claimed and comprising: an insulating base (16; column 4, row 32) comprising a recess; a conductive layer (12, which is used as an electrode and therefore must be conductive; column 4, rows 17-20 and column 5, rows 8-14) comprising a bottom portion with a width accommodated in the recess and an upper portion with an upper width not accommodated in the recess; and a ceramic cover (22 and 24; column 5, rows 45-52) closely surrounding the upper portion of the conductive layer with substantially no gap there between (all of the structures are positioned close to one another, in order to form a substrate support for a plasma processing apparatus), the conductive layer being covered when the pedestal supports a substrate.

7. Regarding the height of the cover ring, Hirano et al. teach that the height of the ceramic cover can be adjusted to achieve a desired etching rate. It would have been obvious to one of ordinary skill in the art to adjust the height as needed (including a height where the cover is lower than a substrate) if desired. See column 7, rows 19-49 of Hirano et al.

8. However, Hirano et al. fail to teach the ceramic cover comprises aluminum oxide.

9. Drage teaches providing an aluminum oxide ceramic cover for a conductive layer of a substrate support pedestal for the purpose of improving uniformity and etch rate in cooperation with other elements of a plasma reactor (column 1, row 60 through column 2, row 2 and column 2, rows 46-62). It is taught that the material for the cover can be chosen depending on the function to be performed.

10. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a cover comprising aluminum oxide in Hirano et al. in order to improve uniformity and etch rate in cooperation with other elements of a plasma reactor as taught by Drage.

11. With respect to claim 2, the upper width is less than the bottom width and a diameter of the substrate (Figures 1 and 2).

12. With respect to claim 4, the ceramic cover further overlies the insulating base (Figure 1).

13. With respect to claim 5, the ceramic cover further comprises an opening exposing the conductive layer (see Figure 2).

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14. With respect to claim 6, the ceramic cover overlies the bottom portion of the conductive layer and further comprises a hollow portion (central portion) accommodating the upper portion of the conductive layer (see Figures 1 and 2).

15. With respect to claim 7, the ceramic cover is ring shaped (column 5, rows 45-52).

16. With respect to claim 11, Hirano et al. further disclose in Figures 1 and 2, a pedestal supporting a substrate in a plasma chamber, comprising: an insulating base (16) having a recess; a ceramic cover (22 and 24) overlying the insulating base and partially veering the conductive layer; wherein the conductive layer is covered when the pedestal supports a substrate and the conductive layer further comprises an upper portion protruding from the recess.

17. With respect to claim 12, the upper portion is with a width less than the diameter of the substrate. Examiner notes that while the prior art discloses processing a substrate to be processed with a diameter greater than that of the upper portion, the courts have ruled that inclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims. In re Young, 75 F.2d 966, 25 USPQ 69 (CCPA 1935) (as restated in In re Otto, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963)).

18. With respect to claim 14, the ceramic cover comprises a hollow (central) portion accommodating the upper portion of the conductive layer.

19. With respect to claim 15, the ceramic cover further comprises a hollow portion accommodating the upper portion of the conductive layer and exposing *the upper* portion of the conductive layer (Figures 1 and 2).

20. With respect to claim 16, the ceramic cover is ring shaped (column 5, rows 45-52).

22. Claims 8 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirano et al. and Drage as applied to claims 1-2, 4-7, 11-12 and 14-16 above and further in view of Applicant's admitted prior art (AAPA).

23. Hirano et al. and Drage disclose a pedestal substantially as claimed and as described above.

24. However, Hirano et al. and Drage fail to teach the insulating base comprised of silicon dioxide.

25. Applicant's admitted prior art teaches that it is known to provide a base of a pedestal constructed of silicon oxide to take advantage of the material's insulative property (page 1).

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26. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided the insulating base constructed of silicon oxide in Hirano et al. and Drage in order to take advantage of the material's insulative property as taught by AAPA.

27. Claims 20-21 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,411,624 to Hirano et al. in view of Applicant's Admitted Prior Art, U.S. Patent Publication No. 2005/0098120 A1 to Maki and U.S. Patent No. 4,793,975 to Drage.

28. Hirano et al. disclose a pedestal supporting a substrate in a plasma chamber substantially as claimed in Figure 1 and comprising: an insulating base (16; column 4, row 32) comprising a recess; a conductive layer (12, which is used as an electrode and therefore must be conductive; column 4, rows 17-20 and column 5, rows 8-14) having a bottom portion embedded in the recess and an upper portion, narrower than the bottom portion and the substrate, protruding from the recess; and a ring-shaped ceramic cover (22 and 24; column 5, rows 45-52) having a hollow (central) portion accommodating the upper portion or the bottom portion of the conductive layer; wherein the conductive layer is covered when the pedestal supports the substrate.

21. Regarding the height of the cover ring, Hirano et al. teach that the height of the ceramic cover can be adjusted to achieve a desired etching rate. It would have been obvious to one of ordinary skill in the art to adjust the height as needed (including a height where the cover is lower than a substrate) if desired. See column 7, rows 19-49 of Hirano et al.

29. However, Hirano et al. fail to teach the insulating base comprised of silicon dioxide.

30. Applicant's admitted prior art teaches that it is known to provide a base of a pedestal constructed of silicon oxide to take advantage of the material's insulative property (page 1).

31. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided the insulating base constructed of silicon oxide in Hirano et al. in order to take advantage of the material's insulative property as taught by AAPA.

32. Hirano et al. and AAPA disclose the invention substantially as claimed and as described above.

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33. However, Hirano et al. and AAPA fail to teach the conductive layer as titanium. Maki teaches the use of titanium as a pedestal material for the purpose of forming a temperature controlling section with superior thermal conductivity, electric conductivity and formability (paragraph 46).

34. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided titanium as a construction material for the conductive layer in Hirano et al. and AAPA in order to form a pedestal having a temperature controlling section with superior thermal conductivity, electrical conductivity and formability as taught by Maki.

35. Hirano et al., AAPA and Maki disclose the invention substantially as claimed and as described above.

36. However, Hirano et al., AAPA and Maki fail to teach the ceramic cover comprises aluminum oxide.

37. Drage teaches providing an aluminum oxide ceramic cover for a conductive layer of a substrate support pedestal for the purpose of improving uniformity and etch rate in cooperation with other elements of a plasma reactor (column 1, row 60 through column 2, row 2 and column 2, rows 46-62). It is taught that the material for the cover can be chosen depending on the function to be performed.

38. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a cover comprising aluminum oxide in Hirano et al., AAPA and Maki in order to improve uniformity and etch rate in cooperation with other elements of a plasma reactor as taught by Drage,

39. With respect to claim 21, the ceramic cover further comprises a hollow portion accommodating the upper portion of the conductive layer and exposing *the upper* portion of the conductive layer (Figures 1 and 2).

40. With respect to claim 23, the conductive layer further comprises a bottom portion, and the width of the upper portion is less than the width of the bottom portion. See Figure 1.

***Response to Arguments***

3. Applicant's arguments filed 7 February 2007 have been fully considered but they are not persuasive.

4. With respect to their being "substantially no" gap between the conductive layer and the ceramic cover, as described above, this allows for a gap. Further, Examiner notes that the bottom surface of the ceramic cover and the upper surface of the conductive layer are adjacent and with not gap. The prior art of record continues to read on the claim.

5. With respect to Drage, Examiner points out that the reference was not relied upon for its teaching of a configuration of a substrate support, rather an alternate ceramic material for forming the ceramic cover already disclosed in Hirano. Drage clearly teaches use of this construction material and provides motivation as described above in the rejection.

6. With respect to claim 20 and Applicant's arguments regarding the combination of Hirano and Maki, Examiner first notes that Examiner does not contend that the conductive layer of Hirano *is* titanium, rather that it would be obvious to one of ordinary skill in the art to construct it from titanium based on the teachings of Maki. Secondly, similar the combination of Hirano and Drage, described above, Examiner points out that the Maki reference was not relied upon for its teaching of a configuration of a substrate support, rather an alternate conductive material for forming the conductive layer already disclosed in Hirano. Maki clearly teaches use of this construction material and provides motivation as described above in the rejection.

7. Further, in response to applicant's arguments regarding the combinations of Hirano with Drage and Maki, it is noted that the courts have ruled that the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).



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**Conclusion**

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 571.272.1440. The examiner can normally be reached on Monday-Friday, 9:00 am-6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571.272.1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Karla Moore  
Primary Examiner  
Art Unit 1763  
11 May 2007